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Changes in care costs associated with cognitive behavioural therapy for psychosis delivered in routine clinical practice

Bryony Sheaves ^{a,b 1}, DCLinPsy, Research Clinical Psychologist

Emmanuelle Peters ^{a,c}, PhD, MSc, Reader in Clinical Psychology

Daniel Stahl ^d, PhD, Senior Lecturer in Biostatistics

Louise Johns ^{a,b}, DPhil, DCLinPsy, Consultant Academic Clinical Psychologist

^a Institute of Psychiatry, Psychology & Neuroscience (IoPPN), King's College London,
Department of Psychology, PO Box 77, London, SE5 8AF, UK

^b Department of Psychiatry, University of Oxford, Department of Psychiatry, Warneford Hospital,
Oxford, OX3 7JX

^c PICuP Clinic, South London and Maudsley NHS Foundation Trust (SLaM), P079, Clinical
Treatment Centre, Maudsley Hospital, Denmark Hill, London, SE5 8AZ, UK

^d Department of Biostatistics, Institute of Psychiatry, Psychology and Neuroscience, King's
College London, London, SE5 8AF, UK

¹. Corresponding author present address: Dr Bryony Sheaves, Department of Psychiatry, University of Oxford, Department of Psychiatry, Warneford Hospital, Oxford, OX3 7JX. Tel.: +441865 226486. Fax: +441865 793101 Email: bryony.sheaves@psych.ox.ac.uk

Abstract

Background: Schizophrenia spectrum disorders are long term disabling conditions placing high economic demands on health services. **Aims:** To investigate whether CBTp, delivered in a specialist psychological therapies service, was associated with a reduction in intensive care costs.

Methods: Days using inpatient care and out of hours crisis support were recorded (N=69).

Costs associated with high intensity care use in the 12 months pre-referral were compared to

during, and 12 months following cessation of therapy. **Results:** Despite the majority of participants incurring £0 at all time periods, costs of intensive mental health care more than halved with CBTp delivery, with a significant decrease during therapy, and at trend level after therapy ($p=.07$). Post-hoc analysis revealed that offsetting the cost of therapy for those who utilised intensive care services at any time point (N=18) resulted in therapy being cost neutral during therapy and cost effective (at trend level) 12 months following cessation of therapy.

Conclusions: CBTp can reduce costs associated with intensive psychiatric care, even in a population where the minority use these services. Investment in therapy may lead to both clinical and financial benefits.

Declaration of interests: None with respect to this publication.

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Introduction

Schizophrenia and related disorders are long term and disabling conditions placing high economic demands on health services. The annual economic cost of schizophrenia for the UK is estimated to be £8.8 billion, with a further £5.0 billion for affective psychosis (Kirkbride et al., 2012). Forty to eighty percent of these costs are attributable to health care, and for schizophrenia alone hospital inpatient admissions account for a substantial proportion of healthcare costs (49%) (Kirkbride et al., 2012). These figures highlight both the large economic impact of psychotic illnesses and also pinpoint areas in which savings can be made. One way to reduce high cost service use (such as inpatient stays) is to provide treatments that enable those with psychosis to manage their symptoms more effectively.

International clinical guidelines recommend Cognitive Behavioural Therapy for psychosis (CBTp) for people with psychosis (National Collaborating Centre for Mental Health, 2014). Meta-analytic results indicate that CBTp has a modest effect on symptoms of psychosis, with lower effect sizes in high quality studies (Jauhar et al., 2014; Sarin, Wallin, & Widerlöv, 2011; Wykes, Steel, Everitt, & Tarrier, 2008), and shorter therapies (Sarin et al., 2011), although they are higher in meta-analyses focusing on medication-resistant groups (effect size=0.47) (Burns, Erickson, & Brenner, 2014) and individualised, formulation-based approaches for positive symptoms (delusions=0.36; hallucinations=0.44) (Van der Gaag, Valmaggia, & Smit, 2014). The UK National Institute for Clinical Excellence (NICE) guidelines (National Collaborating Centre for Mental Health, 2014) report that when compared with standard care alone, CBTp ‘was effective at reducing rehospitalisation rates up to 18 months following the end of treatment’ (p.232), and that there is robust evidence that the duration in hospital was reduced (8.26 days on average).

Four economic evaluations of randomised controlled trials (RCTs) of CBTp have taken place. Three of these indicated that provision of CBTp resulted in no increase in overall cost of care

despite the added cost of therapy (Kuipers et al., 1998a; Peters et al., 2010; Startup, Jackson, Evans, & Bendix, 2005). The fourth economic evaluation (van der Gaag, Stant, Wolters, Buskens, & Wiersma, 2011), conducted in the Netherlands, revealed that implementing CBTp resulted in participants experiencing increased 'time functioning within the normal range' (p.59; 7); however provision of CBTp was accompanied by higher overall costs. The increased cost in the CBTp group was mostly accounted for by a small proportion of participants who were long stay inpatients when they entered the study; CBT was not considered to cause or lengthen their inpatient stay.

Aim of the study

The current evaluation sought to investigate the impact of CBTp delivered in routine clinical practice, rather than an RCT, on cost of care. It was hypothesised that use of high cost care services would be significantly lower i) during therapy and ii) in the 12 months following cessation of therapy, compared with the 12 months prior to referral for therapy.

Materials and Method

Service setting

The study was set in a specialist outpatient, psychological therapies clinic providing CBTp as part of routine clinical practice (The Psychological Interventions Clinic for outpatients with Psychosis (PICuP), South London and Maudsley NHS Foundation Trust (SLaM)). PICuP referrals consist of 58.5% males, with an average age of 38 years (range 15-67). Fifty-two percent are from black and minority ethnic populations. Although PICuP receives referrals nationally, 92% of referrals come from South East London. The clinic has highly positive outcomes on psychosis symptoms, emotional problems, general well-being and life satisfaction, all of which are maintained at follow-up (Peters et al., 2015).

Participants

Participants for this study either had to i) be referred from SLaM, on the basis that their medical records were available to access or ii) have completed all PICuP assessments, within which days using high cost care services was recorded. Inclusion criteria were: consent for data to be used for audit / research, and completion of therapy at least one year prior to the date of data collection (to allow a full follow up period). Only those who had died within the assessment period (from referral to one year post therapy) were excluded from analysis (n=4). Sixty nine participants were recruited from a pool of 183, resulting in a recruitment window from August 2006 to December 2009 (Figure 1). December 2009 was the pre-specified end of the recruitment window chosen to allow enough time for participants to have completed the therapy and follow up period. Referrals were sorted by date of referral and all consecutive patients on the database prior to December 2009 were considered for eligibility.

The mean age of participants was 39 years (standard deviation (SD) = 8.87) and 45 out of 70 were male (64%). Thirty-eight participants were white (British or other; 55%), the remainder (n=31) were from black and minority ethnic groups (14% other, 12% black African, 9% black British, 6% black Caribbean, 3% Indian, 1% Pakistani). Fifty-six participants were single (81%), 7 (10%) were married, 3 were divorced (4%) and 3 described themselves as other (4%). At the point of referral, 35 participants reported auditory hallucinations (51%) and 45 reported delusional beliefs (65%). Mean psychotic symptoms rating scales (Haddock, McCarron, Tarrier, & Faragher, 1999) score for auditory hallucinations was 28.11 (SD = 8.77) and for delusions was 14.00 (SD = 6.03). Both Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996) and Beck Anxiety Inventory (BAI; Beck & Steer, 1990) mean scores fell within the moderate range (BDI-II: mean = 26.13, SD = 12.47; BAI: mean = 21.42, SD = 12.59).

CBTp Intervention:

The intervention was delivered by CBT therapists working in PICuP, broadly in line with the Fowler, Garety and Kuipers (Fowler, Garety, & Kuipers, 1995) model and adhering to a NICE concordant CBTp (Morrison, 2017) and core values (Brabban, Byrne, Longden, & Morrison, 2017). For the current sample the therapy window was 10.5 months (standard deviation 4.8 months) and participants completed a mean of 21 sessions (SD=10). PICuP therapists are all trained in CBT, and their professional training includes clinical psychology, nursing and psychiatry. The majority are not experts in delivering CBTp, and they work with PICuP to develop this expertise by offering therapy sessions as part of their Continuous Professional Development (CPD). These therapists are offered fortnightly group supervision and access to therapy reading material to supplement learning, but no additional specialist training (see Peters et al., 2015, for further information). Therapy sessions are ordinarily delivered weekly or fortnightly for approximately one hour, however the exact scheduling of sessions is tailored to patient preference. The goals of CBTp focus on reducing psychological distress, improving functioning, and self-management, in the context of current psychotic symptoms or co-morbid affective symptoms.

Measures:

Number of days in receipt of high cost care was recorded across three time periods. High cost care included any psychiatric inpatient treatment and any day receiving intensive crisis resolution / home treatment (intensive outpatient out of hours service). The three time periods were: i). 12 months prior to an accepted referral ii). during therapy up to the point of discharge (this time period varied, with a mean duration of 10.5 months, and a range of 3.7 to 24.5 months) and iii) mean of 12 months following discharge from therapy (range 5.75 to 24.04 months). Because the

duration of therapy varied, the follow up period started from the end of therapy date (I.e. a mean duration of 22.5 months from baseline). Given the differences in duration of therapy and follow-up periods, the number of days registered with an inpatient ward or home treatment team was divided by the number of months in each time period in order to provide a consistent measure. These figures were then multiplied by the cost of care per day for inpatient treatment (£300) and crisis resolution/home treatment team (£194) to give a total cost of intensive care services per month. Cost data were the SLaM unit costs for these services at the time of the study, obtained from SLaM Management Accounts. Costs were calculated from the typical yearly cost for providing either service within SLaM, divided by i) 365 days in a year and then ii) a typical caseload (35 for crisis resolution) or number of beds (18 per ward). The cost of CBTp was the PICuP clinic's Cost-per-Case unit costs charged to the Clinical Commissioning Groups (CCGs) per session (£128 or £171²), which was then multiplied by the number of sessions received.

Procedure:

The research database was sorted by date of initial assessment and each participant was assessed for eligibility criteria. The patient electronic health record (EHR) system was used to search for individual patient records. PICuP assessment dates were extracted to create reference periods for data collection (date referral was accepted; pre-therapy assessment; end of therapy assessment; follow up assessment).

Figure 1 about here

² The two different costs relate to different contracts with CCGs depending on volume flow, and not to individual therapist costs. Sessional costs represent an average across the different pay bands of therapists working for the service, and include administrative service costs and Trust overheads.

For each participant, referral/movement data from the EHR were used to ascertain the number of days receiving high cost care. This was converted into a cost per patient per month and entered into the appropriate reference period: one year prior to referral, during therapy or, during the follow up.

Only those who had completed ≥ 5 sessions of therapy were taken forward to the final sample, according to the service definition of a therapy drop-out. High care cost data for the period prior to referral was also collected post-hoc for those who had completed <5 therapy sessions ($n=19$), to ascertain whether those who did not engage in therapy differed in their service use prior to initial assessment for therapy. Four of the 19 patients utilised inpatient or home treatment / crisis resolution services in the year prior to their initial assessment (21%). This compares with 13 of the 69 patients who completed therapy (19%). Those utilising high cost services prior to assessment for therapy were equally distributed between those who did and did not engage in therapy ($X^2(1, n=88) = .12, p = 0.73$).

Analysis

Cost of care data were positively skewed. Non-parametric statistics (Wilcoxon signed rank) and total costs, with range of costs, are therefore used throughout. Average monthly care costs in the period prior to referral were compared with those i) during therapy and ii) after therapy.

Results

The majority of participants in all time periods incurred £0 intensive care costs. However, the number of participants with £0 of intensive care costs increased from 56 (81%) prior to referral, to 63 (91%) during therapy and 62 (90%) following therapy. The total cost of intensive care per

month for the participant group (n=69) more than halved from £32,901 in the period prior to contact with PICuP to £14,844 during therapy (Wilcoxon signed rank test: $Z = -2.22$, $n=69$, $p < .05$) and £12,031 following cessation of therapy (Wilcoxon signed rank test: $Z = -1.81$, $n=69$, $p = .07$). The range of these same costs decreased from £7,556 in the period prior to referral to £6,376 during therapy and £4,773 in the period following therapy.

Post-hoc sub-group analysis was carried out to analyse cost data for just those participants who had utilised high cost services (inpatient and home treatment or crisis resolution services) at any of the three time periods (n=18). Analysis of the trajectory of costs for individual cases demonstrated that 11/18 (61%) of these patients showed a decrease in their service costs both in the therapy period, and the follow up assessment after therapy (compared with the time period from one year prior to referral). Only two people (11%) showing increased costs in both time periods (Figure 2).

Figure 2 about here

The cost of therapy was calculated for the 18 participants who were high cost care users to explore whether cost savings for this sub-group were maintained after accounting for the cost of therapy (Table 1). The mean number of PICuP therapy sessions completed per person was 21 (range 6-35), which equated to a total cost per month of £5,256 (n=18), (mean cost per session=£133). As can be seen in Table 1, this meant that, for these 18 people, a total investment of £5,256 per month resulted in a cost-saving of £18,057 per month during the 10.5 months of therapy (net saving of £12,801), followed by a cost-saving of £20,871 in the 12 months following therapy, compared to the 12 months prior to receiving therapy (total saving

across therapy and follow up periods = £33,672). A median saving of £403 per person per month was made during the CBTp treatment period, despite the additional cost of therapy (monthly intensive psychiatric service costs prior to referral minus (monthly cost of intensive psychiatric services during therapy + cost of therapy)). This difference was not significant (Wilcoxon signed rank test: $Z = -1.41$, $n=18$, $p=.16$), making therapy provision cost neutral for this group. A median saving of £561 per person per month was made in the period following therapy (monthly cost of intensive psychiatric services prior to referral minus monthly cost following CBTp), which was at trend level (Wilcoxon signed rank test: $Z= -1.81$, $n=18$; $p=.07^3$).

Table 1 about here

Discussion/Implications:

Costs associated with high intensity care more than halved during, and in the 12 month period following, receipt of CBTp, compared to the 12 months prior to receiving therapy. The costs associated with high intensity care use fell significantly during therapy, and were at trend level in the 12 month follow up period. There is an indication that this was not an artefact of self-selection of patients; those who dropped out of therapy did not differ on the number of high cost care days prior to entering therapy. Trajectory analysis of those who used high cost care services at any time point ($n=18$) revealed that 61% decreased in the costs associated with high cost care both during therapy, and in the 12 month period following therapy, when compared to 12 months prior to an accepted referral.

³ This analysis is equivalent to the one carried out for the full sample above, since the Wilcoxon signed rank test excludes cases which exhibit no change across time periods (ie. those with £0 care costs at all time periods).

Offsetting the cost of therapy for those receiving high cost care (n=18) revealed that the total cost savings per month in hospitalisation and home treatment team involvement were nearly 3.5 times the investment needed to pay for therapy during the 10.5 months of CBTp provision, followed by a further cost saving of 4 times the therapy costs in the 12 months following therapy. A cost saving of £403 per person per month was made during receipt of therapy, despite the additional cost of therapy. Whilst this was not a significant reduction, it does indicate that the therapy period was at worst cost neutral. A further £561 per person per month cost saving was also made in the 12 months following therapy (when there were no costs of therapy to offset). As indicated above, this was a trend level reduction in costs compared to pre-therapy. Overall these findings demonstrate that for those participants who use high cost care services, provision of CBTp is cost neutral during provision of therapy, with further savings being made (at trend level) in the 12 months following cessation of therapy.

These results have important implications beyond the economic findings alone: the majority of patients do not want to spend time in hospital, admissions often occur involuntarily, and they can be traumatic for service users. For example 80% of a first episode psychosis sample reported being traumatised by being in hospital due to confusion and fear of being in hospital, fear of other patients, adverse staff attitudes and involuntary medication (Rodrigues & Anderson, 2017; Tarrier, Khan, Cater, & Picken, 2007). This contrasts with 96% of service users being satisfied with CBTp treatment offered by PICuP (Lawlor et al., 2017).

The current study benefited from being a retrospective evaluation, set in a specialist psychological therapies service setting. The therapy and the results collected were therefore in no way influenced by the fact that the evaluation was taking place. Instead, they are a good reflection of standard care from this CBTp clinic. When evidence based therapies are

disseminated from clinical trials into routine practice, clinicians can be managing additional service pressures, for example higher caseloads and less intensive training and supervision.

Whilst this is a specialist CBTp clinic, the service pressures are similar to other routine psychology services. However, future research would benefit from replicating this economic evaluation in other services providing CBTp, such as Community Mental Health Teams.

Because of the retrospective nature of the evaluation, patients from the clinic were followed for an average of twelve months following the end of therapy (ie. a mean duration of 22.6 months from the start of therapy). This duration was deemed enough time for fluctuation in functioning, which is realistic for a relapsing condition such as psychosis, and was longer than many CBTp trials (Kuipers et al., 1998b; Peters et al., 2010; van der Gaag et al., 2011). However, despite this, the high proportion of participants who did not incur intensive care costs following therapy was high. A future evaluation might consider increasing both the pre-therapy and the follow up periods further still, in order to capture these infrequent but costly events.

There are a number of limitations to the study. First, there was no control group. One cannot be certain that the decrease in care costs for the sub-group was not due to increased support in general (as opposed to CBTp in particular) or that standard care alone (without additional CBTp) could have resulted in these changes. Second, the method of assessing cost data for home treatment / crisis resolution services was an estimate. This treatment is usually billed on a 'per contact' basis rather than per day. This means that in real terms, the cost per day will vary based on the amount of telephone calls and face to face contacts a patient receives. Third, using cost of high intensity service use data to calculate care costs resulted in positively skewed cost data and hence, floor effects. This level of skew is normal in most health service cost data where resource consumption is low for the majority (Burns, 2007; Kilian, Matschinger, Löffler, Roick,

& Angermeyer, 2002). However a further study might overcome this by including alternative outcomes, for example, re-engagement in employment or cost of secondary care (in the UK, community mental health team) versus primary care (UK: General Practitioner). These additional variables would likely increase sensitivity to change.

In conclusion, overall cost of intensive care was reduced following provision of CBTp in a standard clinical service. For those who used high cost care services prior to referral for therapy, provision of CBTp was cost neutral during therapy (despite additional therapy costs), with further reductions at trend level in the 12 months following cessation of therapy.

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